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EXAMINER	
NOGUEROLA, ALEXANDER STEPHAN	
ART UNIT	PAPER NUMBER
1753	3

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/819,108	Applicant(s) MARIELLA, RAYMOND P.
	Examiner ALEX NOGUEROLA	Art Unit 1753

-- Th MAILING DATE of this communication appears on th cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,8-13 and 16* is/are rejected.

7)☒ Claim(s) *3,5-7,14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 2, 4, and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pethig et al. (WO 97/34689 A1) in view of English language translation of Yatsunami (JP 2000125846 A2), Ager et al. (WO 98/10869 A1), and Suehiro et al. ("The dielectrophoretic movement and positioning of a biological cell using a three-dimensional grid electrodes system, " J. Phys. D. Appl. Phys. 31 (1998) 3298-3305).

Addressing claim 1, Pethig et al. teach a dielectrophoresis separator apparatus for separating target materials from other materials from other materials in a flow of the target materials and the other materials (the abstract and page 4, lines 1-10) comprising

a first trap adapted to receive the target materials and the other materials (T1 in Figure 1), and

a second trap adapted to receive the target materials and the other materials (T2 in Figure 1),

the second trap having electrodes arranged generally transverse to the flow of target materials and the other materials (Figures 2-6).

In the first trap of Pethig et al. the electrodes are arranged generally transverse, not parallel, to the flow of the target materials and the other materials. However, as seen from Yatsunami and Ager et al. dielectrophoresis separator apparatuses having a trap with electrodes arranged generally parallel to the flow of target materials and the other materials were known at the time. See in Yatsunami the abstract and Drawings 1 and 6 and in Ager et al. see the abstract and Figures 1-6. It should also be noted that Ager et al. also teach multiple traps (page 5, lines 4-15). Indeed, at the time of the invention it was known to have in a dielectrophoresis separator apparatus electrodes arranged generally transverse *and* generally parallel to the flow of the target materials and the other materials. See in Suehiro et al. the abstract and Figure 1.

It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide in the first trap electrodes arranged generally parallel to the flow of the target materials and the other materials as taught by Yatsunami, Ager et al., and Suehiro et al. because this will optimize the trap. For example, as taught by Ager et al. in a dielectrophoresis trap with transverse electrodes "the particles are caused to migrate at different rates and those migrating faster are separated from those migrating more slowly or not at all" (page 3, lines 21-29) while in a trap having parallel electrodes the particles may be diverted in a direction transverse to the flow so that some of the particles may directed to one outlet instead of an another outlet (page 4, line 25 – page 5, line 2). In a trap having electrodes both parallel and

transverse to the flow of materials, as taught by Suehiro et al., the particles may be precisely positioned within the trap.

Addressing claims 2, 9, and 13, Yatsunami discloses a source of alternating voltage in paragraph [0018] of the Detailed Description, for example. An alternating voltage source is implied in page 13, lines 11-17 of Ager et al., which discloses sinusoidal voltages. Suehiro et al. shows an alternating voltage source in Figure 2.

Addressing claim 4, Pethig et al. an alternating voltage source is implied in page 8, line 31 – page 9, line 1, which discloses sinusoidal voltages.

Addressing claim 8, Pethig et al. teach a dielectrophoresis separator apparatus for separating target materials from other materials from other materials in a flow of the target materials and the other materials (the abstract and page 4, lines 1-10) comprising

a first trap adapted to receive the target materials and the other materials (T1 in Figure 1), and

an additional trap adapted to receive the target materials and the other materials (T2 in Figure 1),

the additional trap having electrodes arranged generally transverse to the flow of target materials and the other materials (Figures 2-6).

In the first trap of Pethig et al. the electrodes are arranged generally transverse, not parallel, to the flow of the target materials and the other materials. However, as seen from

Yatsunami and Ager et al. dielectrophoresis separator apparatuses having a trap with electrodes arranged generally parallel to the flow of target materials and the other materials were known at the time. See in Yatsunami the abstract and Drawings 1 and 6 and in Ager et al. see the abstract and Figures 1-6. It should also be noted that Ager et al. also teach multiple traps (page 5, lines 4-15). Indeed, at the time of the invention it was known to have in a dielectrophoresis separator apparatus electrodes arranged generally transverse *and* generally parallel to the flow of the target materials and the other materials. See in Suehiro et al. the abstract and Figure 1.

It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide in the first trap electrodes arranged generally parallel to the flow of the target materials and the other materials as taught by Yatsunami, Ager et al., and Suehiro et al. because this will optimize the trap. For example, as taught by Ager et al. in a dielectrophoresis trap with transverse electrodes "the particles are caused to migrate at different rates and those migrating faster are separated from those migrating more slowly or not at all" (page 3, lines 21-29) while in a trap having parallel electrodes the particles may be diverted in a direction transverse to the flow so that some of the particles may directed to one outlet instead of an another outlet (page 4, line 25 – page 5, line 2). In a trap having electrodes both parallel and transverse to the flow of materials, as taught by Suehiro et al., the particles may be precisely positioned within the trap.

As for a second trap and a third trap each having electrodes arranged generally parallel to the flow of the target materials this is merely duplication as parts. As stated by Pethig et al. the example showing two traps merely illustrative of a building block for a larger separator system (page 8, lines 9-16). The number of traps provided will depend on the complexity of the samples

and the desired degree of separation of flow components and the number of analyses to be performed.

Addressing claim 10, as taught by Pethig et al. the amplitude and frequency of the applied signals selected is a matter of optimizing the traps for the materials to be trapped (page 9, line 1 – page 9, line 6).

Addressing claim 11, barring evidence to the contrary, such as unexpected results, the sizes of the traps will be determined by the expected concentration range of target materials, the volume of fluid to be analyzed, and the maximum expected flow rate.

Addressing claim 12, Pethig et al. teach a dielectrophoresis separation method for separating target materials from other materials in a flow of the target materials and the other materials (the abstract and page 4, lines 1-10) comprising

flowing the target materials and other materials through a first trap (T1 in Figure 1),

flowing the target materials and the other materials through an additional trap (T2 in Figure 1),

energizing in the additional trap electrodes arranged generally transverse to the flow of target materials and the other materials (Figures 2-6 and page 9, line 26 – page 12, line 22).

In the first trap of Pethig et al. the electrodes are arranged generally transverse, not parallel, to the flow of the target materials and the other materials. However, as seen from Yatsunami and Ager et al. dielectrophoresis separator apparatuses having a trap with electrodes

arranged generally parallel to the flow of target materials and the other materials were known at the time. See in Yatsunami the abstract and Drawings 1 and 6 and in Ager et al. see the abstract and Figures 1-6. It should also be noted that Ager et al. also teach multiple traps (page 5, lines 4-15). Indeed, at the time of the invention it was known to have in a dielectrophoresis separator apparatus electrodes arranged generally transverse *and* generally parallel to the flow of the target materials and the other materials. See in Suehiro et al. the abstract and Figure 1.

It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide in the first trap electrodes arranged generally parallel to the flow of the target materials and the other materials as taught by Yatsunami, Ager et al., and Suehiro et al. because this will optimize the trap. For example, as taught by Ager et al. in a dielectrophoresis trap with transverse electrodes "the particles are caused to migrate at different rates and those migrating faster are separated from those migrating more slowly or not at all" (page 3, lines 21-29) while in a trap having parallel electrodes the particles may be diverted in a direction transverse to the flow so that some of the particles may directed to one outlet instead of an another outlet (page 4, line 25 – page 5, line 2). In a trap having electrodes both parallel and transverse to the flow of materials, as taught by Suehiro et al., the particles may be precisely positioned within the trap.

Addressing claim 16, Pethig et al. teach a dielectrophoresis separation method for separating target materials from other materials in a flow of the target materials and the other materials (the abstract and page 4, lines 1-10) comprising

flowing the target materials and other materials through a first trap (T1 in Figure 1),

flowing the target materials and the other materials through a second trap (T2 in Figure 1),

energizing in the second trap electrodes arranged generally transverse to the flow of target materials and the other materials (Figures 2-6 and page 9, line 26 – page 12, line 22).

In the first trap of Pethig et al. the electrodes are arranged generally transverse, not parallel, to the flow of the target materials and the other materials. However, as seen from Yatsunami and Ager et al. dielectrophoresis separator apparatuses having a trap with electrodes arranged generally parallel to the flow of target materials and the other materials were known at the time. See in Yatsunami the abstract and Drawings 1 and 6 and in Ager et al. see the abstract and Figures 1-6. It should also be noted that Ager et al. also teach multiple traps (page 5, lines 4-15). Indeed, at the time of the invention it was known to have in a dielectrophoresis separator apparatus electrodes arranged generally transverse *and* generally parallel to the flow of the target materials and the other materials. See in Suehiro et al. the abstract and Figure 1.

It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide in the first trap electrodes arranged generally parallel to the flow of the target materials and the other materials as taught by Yatsunami, Ager et al., and Suehiro et al. because this will optimize the trap. For example, as taught by Ager et al. in a dielectrophoresis trap with transverse electrodes "the particles are caused to migrate at different rates and those migrating faster are separated from those migrating more slowly or not at all" (page 3, lines 21-29) while in a trap having parallel electrodes the particles may be diverted in a direction transverse to the flow so that some of the particles may directed to one outlet instead of an another outlet (page 4, line 25 – page 5, line 2). In a trap having electrodes both parallel and

transverse to the flow of materials, as taught by Suehiro et al., the particles may be precisely positioned within the trap.

As for flowing materials through a second trap and a third trap each having electrodes arranged generally parallel to the flow of the target materials this is merely duplication as parts. As stated by Pethig et al. the example showing two traps merely illustrative of a building block for a larger separator system (page 8, lines 9-16). The number of traps provided will depend on the complexity of the samples and the desired degree of separation of flow components and the number of analyses to be performed.

As for energizing electrodes at around 30 Hz, as taught by Pethig et al. the amplitude and frequency of the applied signals selected is a matter of optimizing the traps for the materials to be trapped (page 9, line 1 – page 9, line 6).

Allowable Subject Matter

4. Claims 3, 5-7, 14, and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter:

a) Claims 3, 7, 14, and 15: Pethig et al. as modified by Yatsunami, Ager et al., and Suehiro et al. only disclose a source of alternating voltage operatively connected to the electrodes arranged parallel to the flow of the target materials;

b) Claims 5 and 6: Pethig et al. as modified by Yatsunami, Ager et al., and Suehiro et al. only disclose a source of alternating voltage operatively connected to the electrodes arranged transversely to the flow of the target materials;

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (703) 305-5686. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Alex Noguerola

Alex Noguerola
June 28, 2003